December 2, 1961

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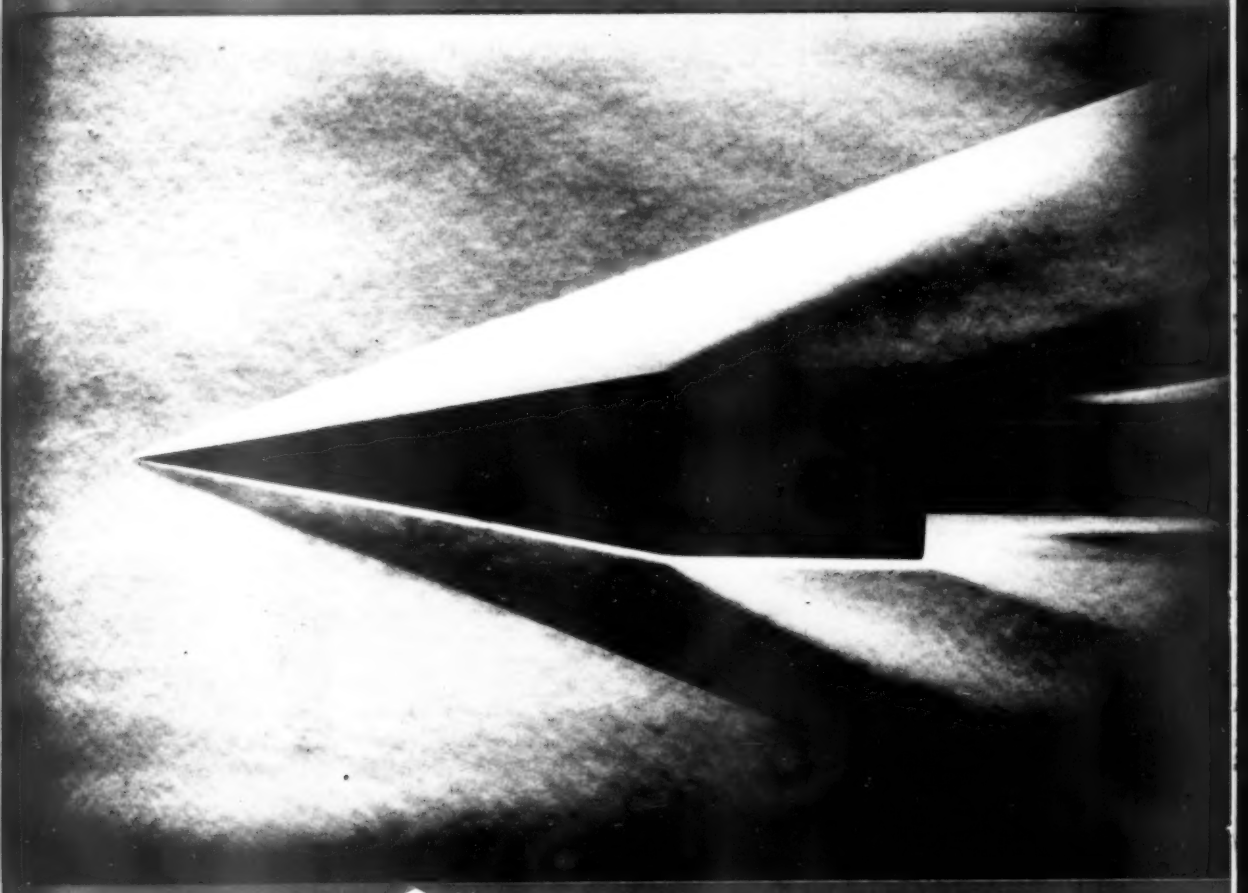

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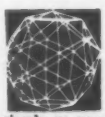

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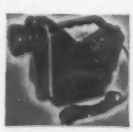

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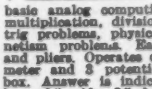

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ANTHROPOLOGY

Pollen Shows Climate

Pollen found with Neanderthal man in Shanidar cave shows that the climate changed from cold to sub-tropical over a period of 15,000 years, Tove Neville reports.

▶ POLLEN OF DATE palms and fir trees are giving new clues to the climate in which primitive Neanderthal man lived.

Dr. Ralph S. Solecki of Columbia University told the American Anthropological Association meeting in Philadelphia that warm and cold weather alternated when Neanderthal man lived in Shanidar cave, Iraq.

Pollen of fir trees found with Shanidar man revealed that he lived in a cold climate about 60,000 years ago. Date palm pollen found with other Shanidar remains indicates that the Neanderthal population, living about 45,000 years ago, enjoyed much warmer weather.

Dr. Solecki, who worked on the excavations in Iraq, said one individual living during this time had had an arm amputated and was also probably blind.

The Shanidar man of 50,000 years ago, living in a cool climate, also met with a sad fate. He had been wounded by a spear thrust in his chest, and the wound had healed only about a week when the roof of the cave fell in and killed him.

Neanderthal man was a hunter who probably clothed himself in skins during the cool periods. The remains of a child dated at 70,000 years ago is the oldest known evidence of the Shanidar people, Dr. Solecki said. No pollen clues to the climate at that time were found with the child.

• Science News Letter, 80:363 December 2, 1961

Mixed Human Population

➤ A HUMAN POPULATION made up of a mixture of many different types has tended to increase the lifespan and fertility in man over the ages.

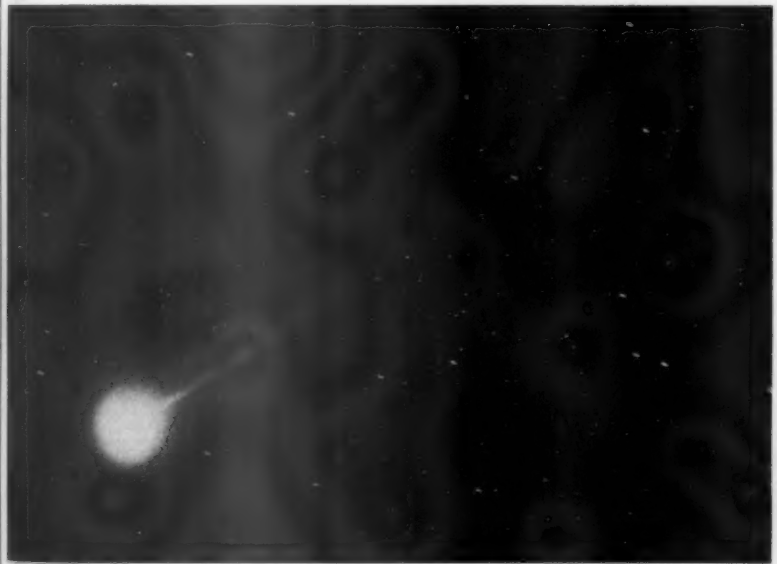
This is the conclusion of Dr. Lawrence Angel of Jefferson Medical College, Philadelphia, who has studied groups of men from about 10,000 B.C. to modern times.

Dr. Angel told SCIENCE SERVICE that he compared studies of Stone Age man in North Africa, the remains of men from Greece and Cyprus and modern man from Peru and Melanesia. He found by studying body and head shapes that differences in persons within a group in early human populations was higher than once believed.

He said he had expected isolated groups would be similar in body build and head shape because of intermarriage. If some groups did inbreed they did not survive, because great variety was found within groups.

Surviving groups must have found ways to pick mates from other groups, accounting for the physical differences from person to person, he reported to the American Anthropological Association meeting in Philadelphia.

• Science News Letter, 80:363 December 2, 1961



COMET SEKI—Expected to vie with Halley's comet in brightness, Comet Seki has been observed as only fifth magnitude. Dr. Elizabeth Roemer of U. S. Naval Observatory, Flagstaff, Ariz., photographed Seki when it had a tail several degrees long. (See stories SNL, 80:304, Nov. 4, 1961, and 80:351, Nov. 25, 1961.)

Evolution in Blood Seen

➤ NEW EVIDENCE indicates that hemoglobin has changed continuously during the course of evolution to accommodate the increasingly complex brain, culminating in man.

This at least seems to be true from studies made on primates by Dr. John Buettner-Janusch of Yale University. He told the American Anthropological Association meeting in Philadelphia that hemoglobin of prosimians, such as lemurs, gives up oxygen faster than the hemoglobin of anthropoidea, such as monkeys, apes and man.

This quick oxygen expulsion may be important for many prosimians that live unusually active lives in tree tops. They need to have a source of oxygen available in moments of stress as they "fly" through the trees.

The hemoglobin of anthropoidea carries more oxygen that is given off more slowly to accommodate the more complex brain, experiments so far indicate, Dr. Buettner-Janusch said.

Hemoglobin is the chemical that gives blood its red color.

• Science News Letter, 80:363 December 2, 1961

Incest Taboos Are Social

➤ THE BELIEF that the reason for the existence of incest taboos was to protect the human race from genetic consequences of marriage of close biological relatives is nonsense, eminent anthropologist Margaret Mead reported. She said there is no biological evidence to support this.

Dr. Mead, associate curator of the American Museum of Natural History in New York City, told SCIENCE SERVICE that incest taboos are social products created by society to protect the household.

Therefore it is a mistake to consider only blood relations as being incestuous, as is commonly done in Western civilization, She said incest taboos must be re-examined to include foster children, foster brothers and sisters as well as blood relations.

This is practiced to some extent by Roman Catholics who see an impediment to marriage between persons reared in the same family.

Incest taboos vary from one society to another and from time to time. It is necessary to re-examine these taboos continuously, Dr. Mead said.

She spoke at a session on sex and culture at the annual meeting of the American Anthropological Association in Philadelphia.

• Science News Letter, 80:363 December 2, 1961

Negroes Not Inferior

➤ THE AMERICAN Anthropological Association repudiated statements now appear-

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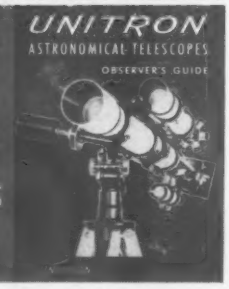

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ing in the United States that Negroes are biologically and in innate mental ability inferior to whites.

The group also reaffirmed that there is no scientifically established evidence to justify the exclusion of any race from the rights guaranteed by the Constitution of the United States.

The basic principles of equality of opportunity and equality before the law are compatible with all that is known about human biology. All races possess ability needed to fully participate in the democratic way of life and in modern technological civilizations.

This resolution was adopted by the Fellows of the American Anthropological Association at the annual meeting in Philadelphia.

• Science News Letter, 80:363 December 2, 1961

True Picture of Incas

▶ AN ETHNOLOGIST is trying to put archaeologists to work digging up the real truth about the mysterious Incas.

This he proposes to do by showing archaeologists exactly where to dig, using descriptions of local Inca sites written by Spaniards shortly after they arrived in the New World.

Dr. John V. Murra of Vassar College, Poughkeepsie, N. Y., appealed to archaeologists at the American Anthropological Association in Philadelphia to go out and dig up the people behind the potsherds, not just the pots, and fit these to historical accounts. He said the history of the Incas has previously been written from the top down, namely from often exaggerated descriptions of their supposed gold and utopian state, or their "wicked" religion.

It is necessary to "dig" from the bottom up, from exact local descriptions of the village, its houses and temples, to find the real truth about how Incas lived and who they were.

Dr. Murra has such a blueprint for the truth in a manuscript containing a report written by Inigo Oitiz de Zuniga, after an inspection trip he made to a village in 1562, a short 30 years after the Spaniards landed.

In his report Oitiz gave an exact description of every house, temple and hut.

The archaeologists digging out a temple will know ahead of time if a building was a state temple or a local shine. No guesswork or uncertainty, generally the great headache of digging up the past, will be involved because the report tells clearly the use of each building.

The class differences in the village, which has the same name today it did in 1562, are also found through the document and are just waiting to be verified archaeologically. The report states the chief had several wives, whereas ordinary workers had only one. Excavating the ancient houses will show whether the living quarters provided for one wife in most cases and many for the chief.

The location of the craftsmen's houses can be found from the report, and a comparison between these and the chief's house or others in the village can be made, he said.

Using the report, it may also be possible to verify whether the so-called Decimal System, having one chief over a thousand households and another over ten thousand households, etc., was an administrative system or, as Dr. Murra believes, a census system merely to keep track of the people.

Archaeologists can also find the Inca market places and learn what kind of trade took place as well as from how far away the Incas came to trade.

This again would give clues to the Mitmaq, or colonists, that came in to trade and show how these differed from the village people. Colonists were often sent out by the Incas to cultivate crops such as coca or pepper, or keep herds at a higher or lower altitude than that of the village. The Incas lived in a vertical world, not on a horizontal plain such as most humans do, Dr. Murra said. The mountains are so steep that the lowest level of living was at 9,000 feet.

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SPACE

Transits Measure Earth

▶ SCIENTISTS need to know more exactly the shape of the earth in order to track and use accurately the Transit satellites that will help ships and aircraft find their position on the globe.

This will take about a year, using both the experimental Transit satellites IV-A and IV-B now circling the earth, Dr. Richard B. Kershner, supervisor of the space development division, Johns Hopkins University Applied Physics Laboratory, Silver Spring, Md., told SCIENCE SERVICE.

He said the two satellites complement each other. Because of the angle relative to the equator at which they travel around the earth, Transit IV-A, launched June 29, 1961, can be used more frequently to find positions in high latitudes whereas Transit IV-B, launched Nov. 15, will cover equatorial regions. It is now possible to find one's position on sea, land or in the air at least two times every day anywhere on earth.

Transit satellites IV-A and IV-B are both carrying chemical and nuclear batteries that are being tested as power systems for the four operational Transits to be launched about a year from now. Both batteries of Transit IV-A, the first nuclear-powered satellite, are still operating.

The nuclear batteries, which contain the radioisotope plutonium-238, are being tested because they have a longer "life" than chemical batteries.

A satellite, Traac (Transit Research And Attitude Control), for testing systems to control the direction a satellite is pointing was launched with the Transit IV-B.

When this control is achieved antennas or cameras of satellites can be turned toward the earth, signaling or taking pictures constantly. This will make a satellite far more efficient.

• Science News Letter, 80:365 December 2, 1961

SPACE

Space Effects on Fertility

▶ THE EFFECTS of weightlessness on fertility and natural radiation damage of human chromosomes will be studied when a second attempt is made to launch a new scientific space capsule, Bios I.

The probe, launched unsuccessfully on Nov. 15, from the Pacific Missile Range, Point Arguello, Calif., was scheduled to make a flight through the inner Van Allen radiation belt before returning to earth.

The 136-pound vehicle will be weightless for 25 minutes. During this time a special capsule will be triggered to expose sea urchin eggs to sperm for fertilization. Single cell divisions in urchin eggs, which is completed in one to two minutes, will also be attempted, the National Aeronautics and Space Administration reported.

The effects on human chromosomes of natural radiation trapped in the Van Allen belt will be studied by exposing blood samples during the flight.

Bacteria commonly found in human intestines will also be carried in the recoverable capsule to learn if they will grow and develop normally after exposure to the radiation. Genetic radiation studies with mold neurospora and experiments with grasshopper nerve fiber in early stages of development to find how chromosomes in cells are broken due to radiation will be made.

Bios I, short for Biological Investigation of Space, will also measure impacts of micrometeors.

An additional experiment will be to explore the characteristics of the Van Allen belt with nuclear emulsion, consisting of silver bromide grains embedded in gelatin.

This emulsion will record the passage of any charged particle that has enough speed to penetrate. When processed, the emulsion shows the charge, mass and velocity of the particles and the direction in space in which they were traveling.

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LOADING BIOS I—A NASA engineer places plastic foam in Bios I as padding for the small capsules containing biological experiments.

METEOROLOGY

Arctic Expedition Finds Record of 1945 Fallout

▶ A RECORD of radioactive fallout from the 1945 atomic bursts over Hiroshima and Nagasaki is believed to have been found embedded in an icecap in northern Ellesmere Island, Canada's northernmost territory.

Glaciologist Dr. Geoffrey Hattersley-Smith of the Canadian Defence Research Board says he took ice samples from a 50-foot hole he dug in the icecap, melted them down and sent them to the atomic plant at Chalk River, Ontario, for analysis.

He said the sample of 1945-46 snowfall is expected to show the density of fallout from the atomic blasts over the twin Japanese cities.

From the bottom of his 50-foot ice pit, dug with pick and shovel, Dr. Hattersley-Smith obtained an 80-foot bore, giving him a climatological record of more than 100 years. He says there is some indication summers have been slightly warmer in the last 20 years.

The expedition found fossilized plants believed to be several hundred million years old—the oldest ever found in the Arctic—and wood judged tens of millions of years old. The tree wood was found on a rock outcrop at the 4,000-foot level of the Gillman glacier.

The finds confirmed the theory that ages ago Arctic Canada was tropical or subtropical. On an earlier expedition, Dr. Hattersley-Smith found coral in the same region.

The expedition also helped the U.S. Air Force find suitable aircraft emergency landing strips.

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SPACE

Nimbus Satellite for 1962

➤ THE FIRST Nimbus weather satellite, second project in a long-range series to improve weather forecasting, is scheduled to be launched during 1962.

It will be heavier and carry better and more equipment than does the currently circling Tiros III weather satellite.

The 650-pound Nimbus space vehicle will differ from Tiros in two aspects, the National Aeronautics and Space Administration reported. It will be oriented so that its television cameras will look down at the earth at all times, and it will be launched into a polar orbit. This orbit permits the cameras to photograph the entire globe once every 24 hours.

A Thor-Agena B rocket will launch the first Nimbus from the Pacific Missile Range into a circular orbit about 600 miles above the earth. The weather satellite will contain as many as six TV cameras to photograph the clouds covering the earth. The cameras are improved versions of those flown in the Tiros satellites.

Nimbus will also carry equipment for a number of infrared radiation measurements similar but superior to those in Tiros III. These experiments are designed to measure the amount of energy lost by the earth from the top of the atmosphere.

Two large paddles of solar cells will convert the sun's energy into electrical power to operate the satellite's instrumentation and supply power to storage batteries for continued operation during periods of darkness.

Cloud cover pictures and other data stored in the satellite will be played back by command from the data-acquisition site at Fairbanks, Alaska. All information obtained from Nimbus will be analyzed by meteorologists of the U.S. Weather Bureau and the Department of Defense.

Foreign scientists will also be invited to participate in the meteorological aspects of the program. Some 40 of them from 27 nations were in Washington attending an International Meteorological Workshop sponsored by NASA and the Weather Bureau.

Aims of the workshop were to present results of the U.S. weather satellite program so that weather services of other nations could acquire a working knowledge of satellite data.

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TECHNOLOGY

Electronic Coin Tossing

➤ AN ELECTRONIC method of tossing coins that determines "heads" or "tails" 200,000 times a second has been devised at the U.S. Navy Electronics Laboratory, San Diego, Calif.

The new machine is not a gambling device but is being used to develop automatic signal detection methods for future Navy radar. It promises to have application in civilian communication systems and quality control.

In the device, electrical circuits play the part of coins. These electrical circuits rest in either one of two states—these two states represent the heads and tails of the coin. Electronic noise generators are used to randomly change the circuit states or "toss the coin."

The heads and tails outcomes are brought out as electrical impulses. Further electronic manipulation of these impulses enables the scientist to duplicate different random processes quite rapidly.

The electronic coin tosser has been evaluated on the basis of many millions of tosses. Excellent agreement has been obtained with the theory of how an ideal coin should behave.

A higher speed machine, operating at a rate of 2,000,000 tosses per second, is currently being planned.

The electronic coin tossing method was devised by R. E. Simmons and G. M. Dillard of the laboratory's technical analysis branch. James W. Caspers, branch head, explained the relation of the new machine to coin matching or tossing:

Almost everyone is familiar with the simple game of matching coins. There have been many popular theories, most of them wrong, regarding the behavior of tossed coins. Few have appreciated or have even heard of the application of coin tossing to areas far removed from games.

Many highly technical and scientific problems can be solved through the method of tossing coins. These problems may require an enormous number of tosses, often running into the millions. Few persons would undertake such a task.

The analytical power of coin tossing and similar random processes has encouraged many scientists and mathematicians to search for less grueling methods of "tossing the coin." Modern electronic computers have been used frequently to synthesize the tossing of coins and other random processes.

Computational rules have been used to provide long lists of pseudorandom numbers having random-like characteristics.

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AEROMEDICINE

Space Fringe Benefits Are Aids to Health

➤ FRINGE BENEFITS from space are helping to improve man's health on earth.

These by-products of space research are advancing medical knowledge, Maj. Gen. Richard L. Bohannon, U.S. Air Force Deputy Surgeon General, told a meeting of Federal Hospital Administrators in Washington, D.C.

"It includes the better understanding we have acquired of certain neurological functions and of the dynamics of the blood from studies of weightlessness," he said, "although weightlessness as a possible barrier to manned space flight continues to worry us."

Cosmonaut Titov's experience of space-sickness has prompted United States space medical research on the effects of changes of blood circulation to the brain resulting from prolonged accelerative forces.

"If these effects are disabling and cannot be overcome by training, then a mechanism to produce artificial gravity must be provided," he said. "There is no substitute for the observations of man in space. The human mind is still far superior to any electromechanical device; for the mind is a versatile, sensitive sensor, capable of thought and judgment."

Research aimed at getting man into space already has paid off on earth and gives promise of more benefits in the future.

Currently the Air Force is studying an irradiation drug to be taken by astronauts who might travel through the Van Allen radiation belts. Radiation is a peril to man in space just as on earth, the General pointed out. An effective irradiation drug may prove of even greater use in civil defense than in space.

Medical aids have resulted from research aimed at space vehicles as well as man in space. These include hydrazine, a drug developed from a missile propellant, used in the treatment of blood disorders; a hand gun-like device for accurate measurement of static electricity in missiles, which may prove invaluable in the operating room; miniaturized valves used in surgery; and remote physiological measuring devices that may revolutionize patient observation and care in the hospital and at home.

Individuals kept at tasks for 72-hour runs in the space cabin simulators at the USAF School of Aerospace Medicine at Brooks Air Force Base reported such bizarre phenomena as seeing washer women hang up clothes across the space chamber, the instrument panel melt, and gaping holes open up in the floor, necessitating feeling of the floor to ascertain its presence.

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AERONAUTICS

TV on Bomber Remedies Pilots' Blind Spots

➤ CLOSED-CIRCUIT television systems are now being used aboard the U. S. Air Force's big B52G bombers to put an end to blind spots in the pilots' range of vision.

A TV camera in the tail section scans approach areas not normally visible to the pilot, including the rear, sides, top and underside. The pilot sees these areas on a monitor in the plane's control section.

The airborne TV equipment is manufactured by Boeing Airplane Company and was developed in cooperation with Foto-Video Electronics, Cedar Grove, N. J.

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PUBLIC SAFETY

Nuclear Test Ban Issues

➤ THE ISSUES were political, not scientific, when the Soviet Union resumed nuclear test ban talks with the United States and Great Britain, Ambassador James J. Wadsworth, this country's former senior delegate to the disarmament talks at Geneva, told SCIENCE SERVICE.

"Scientific opinion, both East and West, has for some time been in accord on the technical questions such as the number and placement of control posts for detection of all tests in the atmosphere, including high altitude tests in space," he said. "Controversy has been primarily over the selection of enforcement personnel to man the control posts as well as selection of an administrator for the entire enforcement operation."

At the beginning of the nuclear test ban talks three years ago the Russians insisted that only they man the monitoring stations within the Soviet Union. The West dismissed self-monitoring by either side as ineffective and took the initiative in proposing that Soviet personnel monitor Western posts while U. S. and British scientists and technicians man the Soviet stations.

The Soviets countered with a Troika proposal, requiring that Soviet, Western and neutral observers man each station, with the network also administered by a three-member group, each with a veto power.

A compromise offer by the United States together with an expression of willingness to ban all bomb tests, both large and small, was in Soviet hands when they abruptly terminated negotiations and announced their intention to launch the recent series of test explosions.

In accepting the Western offer to resume test ban negotiations, the Soviets said that if any power conducted nuclear tests during negotiations, the Soviets would keep on testing. The Soviets justified their resumption of tests in September on the fact that the French, not included in the nuclear ban talks, had tested in the Sahara while negotiations were taking place.

In inviting Russia to resume negotiations for a test ban treaty with the United States and Britain, President Kennedy stated clearly that the United States reserved the right to undertake tests if it is necessary for national and free world security.

"Testing by the United States now is not in the national interest," Ambassador Wadsworth said. "It is not necessary on a military basis. What is necessary is that we be prepared always to look for ways to improve the situation. It is, therefore, to our national interest to keep seeking ways to reduce world tensions."

The primary aim in future negotiations with the Soviets should be to achieve an agreement that minimizes the risk of cheating, he said. "While we should not make a fetish of controls, neither should we assume unreasonable risks to get a signed agreement that is not workable."

Any agreement would become meaningless if Red China should develop an atomic bomb and start testing. Despite this possibility, he favors continued negotiations. "Talking cannot do us any harm. It might do us good."

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TECHNOLOGY

Old Wins Over New in Reclaiming Desert Lands

➤ ANCIENT METHODS have proved superior to modern technology in reclaiming arid lands.

This is particularly true in underdeveloped nations where nearly all arid land in the world is concentrated. Here, there is a maximum of unskilled manpower and a minimum of technical tools and technologists, Dr. Luna B. Leopold, chief hydrologist of the U.S. Geological Survey and member of the United Nations Educational, Scientific and Cultural Organization (UNESCO) advisory committee on arid zones, explained in Washington, D. C.

Such ancient practices under scientific guidance are proving highly successful in various African and Asian countries.

In Israel, waters from the flash floods that seasonally occur on the dry, barren desert in the Negev are being effectively held back by small handmade terraces.

According to history, this method of flood control was used in Biblical times when this area was lush and productive.

Such small scale reclamation programs are an adaptation to nature rather than an attempt to drastically modify the environment. This may eventually prove to be more productive, Dr. Leopold said. Such methods are, of course, unsuitable for nations with a highly advanced technology such as the United States.

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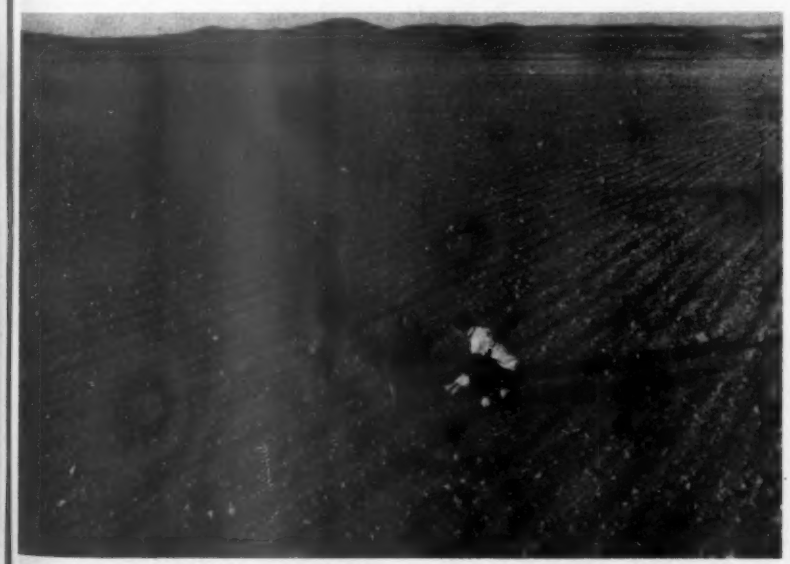

DESERT FIELD—An experimental field in the Morocco desert.

ROCKETS AND MISSILES

Give Atomic Bombs to U. N., Scientist Advises

➤ THE UNITED STATES should offer now to give, lock, stock and barrel, its entire nuclear armament, including all means of delivery and information about impending attack, to the United Nations, Dr. Maurice B. Visscher, professor of physiology at the University of Minnesota Medical School, Minneapolis, proposed in a speech in that city.

This bold step would, in Dr. Visscher's judgment, be a deterrent to world war because it would remove any possible military advantage that a potential enemy such as the USSR would have in destroying the population centers of the United States.

Safe-guarding conditions before turning over atomic bombs to the U. N., proposed by Dr. Visscher, include:

1. Any country possessing nuclear weapons that refused to do the same as the United States would not be allowed full membership in the U. N. or have a vote on policy decisions.

2. Voting strength in the U. N. would be related to numbers of literate citizens in any country.

3. The U. N. nuclear arsenal would be in uninhabited territory or mobile in submarines, on land and in the air.

4. Such bases would be controlled by the U. N. and manned by directly recruited U. N. forces and not forces assigned by any country.

"There is no hope for long-term survival unless the people reassert their rights to know, think and be heard," Dr. Visscher said. "We will survive if an informed citizenry is allowed to decide and bestirs itself."

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PUBLIC HEALTH

Syphilis Increase Continues in U. S.

➤ THE SHARP INCREASE of syphilis in the U. S. has continued during the first nine months of the 1961 fiscal year with 14,019 cases reported during that period.

The following facts were uncovered during a recent U. S. Public Health Service study:

More men have this venereal disease than women.

There are more syphilis cases than gonorrhea.

Large cities in many states accounted for most of the increase. Miami, Fla., had the highest rate in 1960.

All ages and both sexes were included in the increase.

Dr. William J. Brown, chief of the Public Health Service venereal disease branch, Communicable Disease Center, Atlanta, Ga., and Norman W. Axnick, statistician, reported the findings in Public Health Reports, 76:999, 1961.

Reduction of primary and secondary syphilis cases could be achieved, the researchers said, if all private patients are interviewed and "cluster" testing applied to persons in their social environment.

All private laboratories and hospitals doing positive blood tests for syphilis should be surveyed.

Private physicians and health departments in all states should also strengthen their visitation programs.

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EDUCATION

Natural Sciences Favored In Granting Graduate Aid

➤ GRADUATE STUDENTS in physical and biological sciences who are rated as "poor" Ph.D. material by faculty members still have almost the same chance for financial aid as social science and humanities students rated "superior" or "excellent," the University of Chicago's National Opinion Research Center found in a nation-wide study.

The report indicates that high scholastic ability is less important than studying "the right thing at the right school" for many students getting "stipend income" from scholarships, teaching assistantships or research assistantships.

Graduate students in the natural sciences (physics, biology, chemistry) get more and better financial help than do those in other fields, NORC said. Public school students are given preference over private school students. Additionally, candidates for doctor's degrees get more and better stipends than do master's candidates.

The study of a cross-section of the 63,000 graduate students in United States schools was made at the start of the 1958-59 school year, before the National Defense Education Act went into effect. Professional fields such as law and medicine were excluded. At that time, and probably since, the Federal Government was helping more than twice as many graduate natural science students as those studying either humanities or social science.

"The sharp differences in financial help in different fields of study and types of schools suggest that this nation has a long way to go before we can say that we are providing real encouragement for excellence across the board in arts and sciences graduate training," said Dr. James A. Davis, NORC senior study director.

Other study findings show that the students' median income was about $400 monthly. An average of 15% of this was spent on education. Almost half of the students got $150 a month or more from stipends, their single most important source of income. Forty percent received half their income from stipends.

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TECHNOLOGY

Today's Inks Disappear In Document Preservation

➤ BECAUSE inks "are not what they used to be," future historians may be without original source documents.

Before letters, diaries and papers can be sealed permanently in plastic, the paper must be treated to halt deterioration. The standard treatment consists of one or more chemical baths.

This is fine for 17th, 18th or 19th century documents, but it floats ink right off 20th century documents. New inks are water soluble; old ones were not.

The division of industrial research at Washington State University currently is studying the problem. The school's Holland Library is custodian of more than half a million documents pertaining to the history of the Pacific Northwest, and most of the papers are less than 70 years old.

"We are investigating various misting and atomizing processes," explains Dr. Mark F. Adams, head of the division's chemistry research laboratory. "We hope to come up with an answer before many rare and valuable documents are lost forever."

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SPACE

Liquid Hydrogen Rocket Successfully Tested

➤ THE FIRST U. S. liquid hydrogen rocket has successfully passed its preliminary flight rating test.

The engine, known as RL-10, performs about 30% better than current rockets using conventional hydrocarbon fuels such as kerosene.

Two of the liquid hydrogen engines will power the Centaur space vehicle, scheduled for its first flight test within a few months.

The test, consisting of 20 captive firings under simulated space conditions, was completed in five days. The RL-10 was developed for the National Aeronautics and Space Administration by Pratt and Whitney Division of United Aircraft Corporation in West Palm Beach, Fla.

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IN SCIEN

MEDICINE

New Antidote Saves Life Of Poisoned Child

➤ A TWO-YEAR-OLD BOY who was almost fatally poisoned by swallowing parathion, an insecticide, was revived in less than 20 minutes by taking a new antidote.

Atropine, the usual antidote, was first given, but it did little to improve the child's condition, Drs. Griffith E. Quinby, Wenatchee, Wash., and Gordon B. Clappison, Yakima, Wash., reported in the Archives of Environmental Health, 3:538, 1961.

The doctors decided to try 2-PAM (2-pyridine aldoxime methiodide) prepared by Drs. I. B. Wilson, S. Ginsburg and H. Kewitz of Columbia University's College of Physicians and Surgeons, New York. Although the antidote was previously used in Japan and other countries, this is probably the first time it was tried in this country.

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MEDICINE

Sleeping Pills Popular For Committing Suicide

➤ AMONG THOSE who attempt suicide about 20% use poison, mostly sleeping pills.

Most of those who use this method are women, and if the statistics compiled at New York's Jacobi Hospital are an indication, the suicidal mind is unimaginative at picking a poison.

Of 232 attempted suicide cases (178 women and 54 men) seen at the hospital between 1955-1960, some tried aspirin, others household solvents. But nearly 60% of the poison-users took barbiturates—sedatives or sleeping pills. Another 10% preferred meprobamate (Equanil), a commonly used tranquilizer.

All other agents were used less frequently and about equally, Drs. Joseph Hirsh and Howard L. Zauder and Bernadette M. Drolette of Albert Einstein College of Medicine report.

The popularity the poison method enjoys among women, Dr. Hirsh states, is not unexpected in that "women appear to employ methods of suiciding which involve an important factor—time—allowing for rescue . . . and resuscitation." Men tend to use more precipitous, more action-involved, more lethal agents and methods than women do.

As a result, the scientists report in the Americal Medical Association's Archives of Environmental Health, 3:90, 1961, the male to female ratio of successful suicides in the United States is four to one, but for suicidal attempts, the ratio is virtually reversed.

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NE FIELDS

NATURAL RESOURCES

Wildlife Useless as Food Source in Atomic War

➤ WILDLIFE may become unfit as a food source in the event of a nuclear attack, the National Wildlife Federation reported in Washington, D. C.

In the past, Americans have used wildlife as a food source in emergency situations; but in an atomic war this source may be drastically diminished, if not eliminated, due to inadequate protection.

Fish and waterfowl may be the first to become unfit for human consumption following a nuclear bombing because of the concentrations of dangerous radionuclides washing into lakes and streams. In addition, exposure to high levels of radioactivity might make reproduction impossible.

"Endangered species, such as the whooping cranes, could be wiped out entirely," the Federation said. No plans have been made or considered to include wildlife in the shelter program.

"Man knows little—and must learn more—about the effects of radiation, the assimilation of radionuclides such as iodine-131, strontium-89, strontium-90, cesium-137 and others into the body, and the result of eating food contaminated by them," the Federation said.

The Atomic Energy Commission is currently supporting research on the effects on wildlife of present fallout levels.

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MEDICINE

Mobile Unit Records Heart Information

➤ A MOBILE electronic unit that records 12 kinds of information about the heart is being tested at the University of California, Los Angeles. It is hoped that such information may spot early heart trouble.

Known as the heart function analyzer, the unit was especially designed and built by the Telecomputing Corporation with the collaboration of Louis Fields.

It has been donated by the firm to Dr. Clarence Agress, University of California, Los Angeles, Medical School heart investigator, through the Los Angeles County Heart Association.

The new weapon in the battle against heart disease is a two by four by three and a half feet mobile unit that can be wheeled into a laboratory or to a patient's bedside. Such sources of information as heart sounds, electrocardiogram, pulse pressure and frequency analysis of heart mechanical activity are recorded simultaneously. Research with the device is being carried out primarily at the Los Angeles Veterans Administration Center.

A small microphone placed on the chest just above the subject's heart picks up information recorded by the machine. This information is translated into 12 tiny light beams, which play upon a light-sensitive roll of paper, and is thus recorded permanently for analysis by the investigators.

Emphasis in the investigative program for which the machine was tailored is on low-frequency vibrations. These reflect activity of the heart muscle itself as well as the valve sounds which dominate the unusual audible range of the stethoscope and the standard phonocardiogram.

Experiments to date have demonstrated the new analysis system can pick up many subtle changes in heart functions not apparent in conventional electrocardiograms. It has also demonstrated an increased accuracy of 22% over the electrocardiogram in detecting coronary disease.

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PHYSICS

Black Void Reactors for Fast and Slow Neutrons

➤ A NEW ATOMIC reactor for research, the Black Void Reactor, has been developed by scientists at the National Bureau of Standards. The idea, conceived by C. O. Muehlhause of Standards, would make possible the simultaneous presence of fast and slow neutron fluxes separated in space.

Fast neutrons released by fission in the walls of cylindrical fuel assemblies are slowed down by the moderator. A certain portion of these slow, or "thermal," neutrons return to the fuel assembly, where they are reconverted into fast fission neutrons to maintain the chain reaction.

Certain neutrons irradiate the void interior of the reactor tube, providing space for testing the effects of radiation on instruments. In addition, this arrangement constitutes a type of flux trap that yields higher neutron output for a given power input than the conventional system.

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SPACE

Figure Lunar Altitude With Horizon Sensor

➤ MOON TRAVELERS will be able to figure out how far above the lunar surface their spacecraft is by using a horizon sensor.

This device can be used to find the diameter of the apparent lunar disc, information that aids in finding an approaching space vehicle's altitude, Dr. P. J. de Fries of George C. Marshall Space Flight Center, Huntsville, Ala., reported to the National Aeronautics and Space Administration.

Dr. de Fries cautions that if the radius is not accurately known errors will result. Other causes of error in figuring the position could be caused by electronic equipment, and the unevenness of the moon's surface, which is dotted with ring mountains and streaked with mountain ranges and cracks. Therefore an error analysis would be necessary to know the exact spot, important information if a lunar vehicle lands on the moon.

• Science News Letter, 80:369 December 2, 1961

CONSERVATION

Unite to Solve Problem Of Pesticide vs. Wildlife

➤ EUROPEAN and American scientists have banded together to form an international committee for coordinating research on the harmful effects of pesticides on wildlife.

The committee, an offshoot of the International Union for the Protection of Nature and Natural Resources was formed in Leiden, Netherlands. It will also act as a clearing house for exchanging information on pesticide-wildlife research.

Needless duplication will be avoided by coordinating all the research programs on pesticide damage to fish and animals, Dr. John L. George, U. S. Fish and Wildlife expert and member of the new committee, said. Results of studies now being conducted in England on chemical spraying of seeds could probably be applied in Texas, which faces a similar problem, the scientist said.

Other plans of the new committee include the standardization of the conflicting pesticide terminology on both sides of the Atlantic. The Union, parent organization of the committee, is made up of naturalists, conservationists and scientific organizations such as the National Audubon Society.

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TECHNOLOGY

Computer Control System Like Auto and Driver

➤ TO UNDERSTAND computer control systems, just think of an automobile and a driver, Dr. Cornelius T. Leondes of the University of California, Los Angeles, advises.

Basically, a control system, including the guidance of space vehicles and the delivery of intercontinental missiles, consists of a computer that digests and evaluates data from the sensors and at the same time controls the actuators.

One of the most complex control systems, Dr. Leondes finds, is a man (and certainly a woman) driving a car. The eyes and ears are sensors feeding information to man's super-computer, the brain, which through the hands and feet controls the actuators, such as the steering wheel and the accelerator.

In the future, computer control systems will guide interplanetary space probes and may well navigate hydrofoil ocean freighters skimming above the water at 100 miles per hour.

In these automated ships, the sensors—gyroscopes and accelerometers—will supply information on location and acceleration, which will allow the computer to fix the proper velocity and direction, while the hydrofoils will serve as actuators.

Dr. Leondes is a 34-year-old professor of engineering, scientific adviser to the U.S. Air Force and the National Aeronautics and Space Administration, and editor of the recently published book on "Computer Control Systems Technology."

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MEDICINE

The Fight Against Arthritis

Treatment can relieve the pain and crippling effects of this widespread disease while the search for a cause and cure goes on, Faye Marley reports.

➤ TODAY ARTHRITIS STRIKES one out of five families. More than 11,000,000 persons in the U.S. alone have some form of this painful, and often crippling, affliction.

So far there is no cure, and the fight against this disease will go on until both cause and cure are found. The National Institute of Arthritis and Metabolic Diseases, Bethesda, Md., will spend $9,000,000 on research in rheumatic diseases during the coming year.

The weapons available now, aside from research, consist of early, accurate diagnosis, continually tested new drugs and treatment, most important of which is exercise prescribed by a qualified physician.

Osteoarthritis, the most common type, happens to nearly everyone with advancing years. But it is rheumatoid arthritis that is most crippling.

Rheumatoid arthritis is found most frequently in women 40 or above, but no age is exempt; it even appears in infancy. Men, of course, are often afflicted.

Another disabling type of arthritis, which most often occurs in young men, is rheumatoid or ankylosing spondylitis. Without proper care the spine gradually becomes bent over and stiff, and other joints, particularly the hips and shoulders, also may be affected.

Dr. Joseph J. Bunim, clinical director of the National Institute of Arthritis and Metabolic Diseases, told SCIENCE SERVICE that it is important for the family physician to diagnose the type of arthritis as precisely as possible.

Test for Diagnosing Arthritis

A simple and fast test for diagnosing rheumatoid arthritis is called the Bentonite Flocculation Test (BFT). Dr. Bunim said it is not only as accurate as other tests in use, but it has the practical advantage of giving results in 20 minutes instead of the few days needed with other methods. (Only the Latex Fixation Test is as quick, and bentonite is more stable than latex.)

"We mix a small amount of colloidal clay called bentonite, which is widely used for commercial purposes," Dr. Bunim said, "with normal human gamma globulin. To this we add a drop of blood serum from the person we are testing. If the test is positive for rheumatoid arthritis, the bentonite particles will clump together or flocculate within a few minutes and we can see the results under a microscope."

Other signs that show the difference between the rheumatoid type and osteoarthritis are these:

The palm of the osteoarthritis patient will be dry, whereas the rheumatoid patient's hand is usually moist.

The osteoarthritic patient's joints will be hard, bony and knobby, in contrast to the soft swelling of the rheumatoid's.

Nodules under the skin are seen in 20% of rheumatoid arthritis patients but are absent in the osteoarthritis patient, who also shows no signs of elevated sedimentation rate and moderate anemia, common to the rheumatoid patient.

X-ray pictures are likewise important in finding out which of these two types of arthritis may be present.

One of the more important discoveries in the past 10 or 15 years of research has been the "rheumatoid factor," which causes sensitized particles to stick together in the serum of patients with active rheumatoid arthritis. The BFT is based on this factor.

An important theory concerns autoimmunity. Sir Frank Macfarlane Burnet, the Australian virologist who shared the 1960 Nobel Prize in Medicine, discovered that the body loses its ability to distinguish between tissue proteins that originate from its "self." It thus reacts to its own cells as if they were foreign material.

Cortisone was first used for treating rheumatoid arthritis in 1948. One of the newest additions to the group of anti-inflammatory steroid compounds, including hydrocortisone, triamcinolone and prednisone, is dexamethasone, also called by trade names such as Decadron, Deronil, Gammacorten and Delenar.

Dexamethasone is about six times more potent than prednisone and about 25 times more potent than hydrocortisone. Smaller amounts may provide the same or more relief than is obtained with larger doses of the older steroids. Some patients who do not respond to other treatment may benefit from dexamethasone. However, Dr. Bunim said potency in itself is of no real advantage.

Other treatments for patients who do not respond to aspirin, heat, rest and exercise—the conservative treatments—may include a choice of gold compounds, phenylbutazone or antimalarial drugs.

Although the cure for rheumatoid arthritis is not yet in sight, Dr. Bunim emphasizes the improvement in patients treated with available agents.

"They frequently enhance the functional capacity of the patient, restoring him to a state of self-sufficiency and employability," Dr. Bunim said.

"The risk involved in prescribing an effective anti-rheumatic agent that is potentially toxic must constantly be balanced by the real risk of permitting the disease to progress relentlessly to destruction, deformity, disability and demoralization."

ARTHRITIS DID THIS—The gnarled hands of this rheumatoid arthritis victim belong to one of millions crippled by this disease.

The National Institute of Arthritis and Metabolic Diseases, along with the Arthritis and Rheumatism Foundation and other agencies dedicated to rheumatic diseases and their cure, deplores quack remedies.

Among the "remedies" that cost arthritis sufferers a quarter of a billion dollars a year are treatments ranging from "immune milk" to uranium. Vibrators and other devices, liniments, food supplements and "treatment centers" attract victims who are willing to pay any amount to get relief.

If a patient is overweight, physicians treating arthritis may prescribe a reducing diet, or if hormones are being used, may restrict salt use, but NIH has issued a statement that says there is no scientific evidence that specific items in the diet of the average arthritis patient will cure or benefit his condition.

"The Arthritis Hoax," Public Affairs Pamphlet No. 297, prepared in cooperation with the Arthritis and Rheumatism Foundation, describes frauds and fallacies costing arthritis sufferers $250,000,000 annually.

Government agents have had to take action against operators of abandoned uranium mines, for example, which under the name of "uranitoriums" have been luring arthritics who hope to benefit from the radiation. On examination, the amount of radiation in the ore of such mines was found to be about equal to that received from an illuminated watch dial.

Bonafide treatment recommended in the U.S. Public Health Service pamphlet, Strike Back at Arthritis, includes:

1. Watching posture. When in bed the patient should lie flat on the back, with a board under the mattress. At least twice a day for about 15 minutes he should lie on his stomach, keeping hips and knees straight.

When walking, the arthritic should let the arms swing easily at the side, step or "push off" from the ball of the foot, not walk flat-footed, walk stiff-legged or with hips and knees bent.

When sitting, a chair should be used with a firm seat and straight back. The patient should avoid sitting in low chairs or in soft, stuffed chairs. He should keep his feet flat on the floor, his hips and shoulders up against the back of the chair.

2. Use of heat. This includes tub baths, with temperature between 100 and 102 degrees Fahrenheit, for about 15 to 20 minutes once a day.

Hot compresses may be placed directly on the joint or part to be treated for no more than 20 to 30 minutes at a time.

A 250-watt reflector heat bulb (not a sun lamp) is effective in heating a single part of the body, such as the shoulder, for 20 to 30 minutes at a time. This should be at least 18 inches away from the skin or farther away for comfort.

A paraffin bath is useful for treating the hands and wrists. A three-quart pot placed in hot water should be used to heat three pounds of ordinary paraffin, mixed with six ounces of mineral oil, to 125 degrees Fahr-

(Continued on p. 374)

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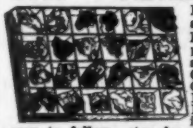

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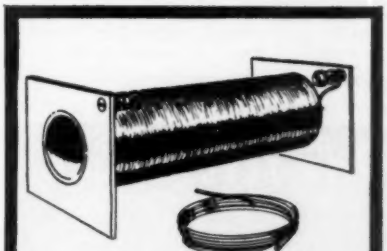

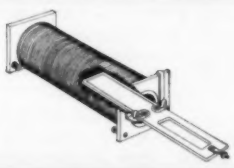

Current Balance Kit — used with the Solenoid to measure a magnetic field in fundamental units of mass length and current. The force of gravity at one end of a mechanical arm balance counteracts the magnetic force of interaction between an unknown field and a current-carrying segment of wire at the other end. **Each $1.80.**

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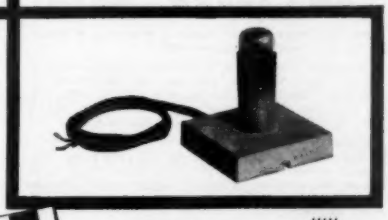

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• Books of the Week •

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

ABC's OF ULTRASONICS—Alan Andrews—*Sams (Bobbs)*, 96 p., illus., paper, $1.95. About industrial applications of ultrasonic waves.

AKHMANOVA RUSSIAN DICTIONARY: Russian-English and English-Russian—O. S. Akhmanova—*Bantam Bks*, 820 p., paper, 95¢. Pocket-size and up-to-date.

ALEXANDER WILSON: Naturalist and Pioneer—Robert Cantwell—*Lippincott*, 319 p., illus., $15. Biography of the first naturalist-painter to study American birds in their habitats, with reproductions of his paintings.

ANTARCTIC COMMAND—Finn Ronne—*Bobbs*, 271 p., photographs, $5. Story of the IGY expeditionary force at isolated Ellsworth Station, told by their commander.

ANTIMICROBIAL AGENTS ANNUAL, 1960—Peter Gray, Benjamin Tabenkin and S. G. Bradley, Eds.—*Plenum Press*, 670 p., illus., $8.50. Proceedings of 1960 Conference, sponsored by the Society for Industrial Microbiology.

ARTIFICIAL EARTH SATTELITES, Vol. 6—L. V. Kurnosova, Ed., transl. from Russian—*Plenum Press*, 170 p., illus., $7.50. Translation of series on Soviet space research published in Moscow by the USSR Academy of Sciences in 1961.

ASTRONOMICAL SPECTROSCOPY—A. D. Thackeray—*Macmillan*, 256 p., illus., $3.95. Review of theory and practice of spectroscopy and the fundamental facts about the universe it helped to establish.

AUSTRIA—Eugene Susini, transl. from French by Mary Fitton—*Oxford Univ. Press*, 152 p., 274 photographs, $12.50. Handsome volume about Austria's eight provinces.

THE BASIS OF SCIENTIFIC THINKING—Samuel Reiss—*Philosophical Lib.*, 262 p., $4.75. Develops author's "psycho-logic" approach concerned with the logical aspect of unconsciously formulated assumptions that underlie conscious thinking.

THE BOY'S BOOK OF ROCKS AND FOSSILS—I. O. Evans—*Roy Pubs.*, 144 p., photographs, diagrs., $3.75. Boy's introduction to geology.

CLOTHES AND CLOTH: America's Apparel Business—Pauline Arnold and Percival White—*Holiday House*, 355 p., illus., $4.50. Focuses on today's textile and apparel industries.

COLOURED KEY TO THE WILDFOWL OF THE WORLD—Peter Scott—*Scribner*, rev. ed., 91 p., illus. by author, $3.50. Compact fieldbook for identification of 247 kinds of duck, goose or swan.

COMMON NATIVE ANIMALS: Finding, Identifying, Keeping, Studying—M. F. Vessel and E. J. Harrington—*Chandler Pub.*, 175 p., illus. by Dorothy Thurman, $2.95. Brief life data on the more commonly collected wild animals.

COMPUTERS: From Sand Table to Electronic Brain—Alan Vorwald and Frank Clark—*Whittlesey House*, 176 p., illus. by Frank Aloise, $3.50. Tells young people how the computer was developed and how it works.

CRYOGENIC MATERIALS DATA HANDBOOK—T. F. Durham, R. M. McClintock and R. P. Reed—*NBS (OTS)*, rev. ed, 555 p., paper, graphs, $7. Basic handbook, gives lab test data on 22 properties of metals, alloys and non-metallic materials at cryogenic temperatures, 1940 through 1959.

CYTOLOGY—G. B. Wilson and John H. Morrison—*Reinhold*, 297 p., illus., $7.50. Introductory course, treats the basic facts, concepts and problems of cellular biology.

DICTIONARY OF TECHNICAL TERMS—Frederic Swing Crispin—*Bruce Pub.*, rev. 9th ed., 454 p., illus., $5. Definitions of commonly used expressions in technical trades and industry.

ELECTRONIC GAMES & TOYS YOU CAN BUILD—Len Buckwalter—*Sams (Bobbs)*, 128 p., illus., paper, $2.50. Instructions for electronic projects.

EXPLORING BEHAVIOR: An Introduction to Psychology—Douglas K. Candland and James F. Campbell—*Basic Bks*, 179 p., illus., $4.50. Introduces general reader to the nature of basic psychological research.

EXPLORING THE SEACOAST—John and Jane Greverus Perry—*Whittlesey House*, 189 p., illus. by Stephen Kraft, $3.50. Tells boys and girls how to go about exploring the coast.

EXPRESS TO THE STARS: Rockets in Action—Homer E. Newell, foreword by Lyndon B. Johnson—*McGraw*, 324 p., illus. by Gustav Schrotter, $5.75. Non-technical and concise discussion of modern rocketry in theory and action.

GEOGRAPHY: Our Planet, Its Peoples and Resources—Gordon Manley and others, Eds.—*Doubleday*, 360 p., illus. by Hans Erni, $9.95. Pictorial reference volume for young people on 150 aspects of regional geography.

GUIDE TO ROCKETS, MISSILES AND SATELLITES—Homer E. Newell—*Whittlesey House*, 2nd ed., 96 p., photographs, $3.25. For quick reference.

HIGH SPEED PROBLEMS OF AIRCRAFT AND EXPERIMENTAL METHODS—A. F. Donovan and others, Eds.—*Princeton Univ. Press*, 976 p., illus., $22.50. Includes extensive treatment of supersonic and hypersonic wind tunnel techniques and free flight research.

HUMAN VALUES AND SCIENCE, ART AND MATHEMATICS—Lillian R. Lieber—*Norton*, 149 p., illus. by Hugh G. Lieber, $3.95. Original and amusing use of mathematical concepts to give better idea of what the human mind is capable of.

HURRICANE FROM CHINA—Denis Warner—*Macmillan*, 210 p., $3.95. Australian journalist's analysis of what is happening in China today.

LOUIS PASTEUR: The Story of His Major Discoveries—Jacques Nicolle—*Basic Bks.*, 252 p., illus., $4.50. French biologist's biography stresses Pasteur's methods of investigation.

MEGALOPOLIS: The Urbanized Northeastern Seaboard of the United States—Jean Gottman—*Twentieth Century Fund*, 810 p., maps, $10. Scholarly analysis of the complex forces that have created the region's pattern of urbanized concentration, "a trend gradually becoming characteristic of this century."

MEN OF SPACE: Profiles of the Leaders in Space Research, Development and Exploration, Vol. 3—Shirley Thomas—*Chilton Co.*, 247 p., photographs, $3.95. Biographies of Doolittle, Draper, Flickinger, Kantrowitz and others.

MY WILDERNESS: East to Katahdin—William O. Douglas—*Doubleday*, 290 p., illus. by Francis Lee Jacques, $4.95. Covers 11 wilderness areas between Arizona and Maine, and finds man "the worst predator of all."

NON-LINEAR THEORY OF THIN ELASTIC SHELLS—Kh. M. Mushtari and K. Z. Galimov, transl. from Russian—*Tatknigoizdat (OTS)*, 374 p., illus., $3.75. Published for NSF and NASA by Israel Program for Scientific Translations.

PEACETIME USES OF OUTER SPACE—Lloyd V.

(Continued on p. 375)

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Fight Against Arthritis

(Continued from p. 371)

enheit. With fingers curled, the hand and wrist should be dipped in and out of the mixture, waiting a few seconds to let the paraffin harden slightly.

The dipping should be repeated eight or ten times until a thick glove of solidified paraffin is formed. To prevent the paraffin glove from cracking, the fingers should not be moved.

The "gloved" hand should be wrapped in wax paper and then in a bath towel, held in place by rubber bands for 20 minutes. The paraffin, when peeled off, can be returned to the double boiler for repeated use.

Massage helps in some cases, but may cause harm if not done properly. It should not be done directly over acutely inflamed arthritic joints. The family doctor should decide whether or not massage would be beneficial. But mechanical vibrators or massage machines are not recommended.

Exercise, the most important treatment to prevent crippling, must be prescribed by the doctor. A number of non-tiring exercises with illustrations are described in the PHS pamphlet.

Splinting or using a cast may be prescribed by the physician.

Good fitting shoes are essential. They should be prescribed.

Canes or crutches may help.

Self-help devices can be ordered from the Arthritis Self-Help Office, Institute of Physical Medicine and Rehabilitation, 400 East 34th St., New York, N. Y.

• Science News Letter, 80:370 December 2, 1961

INVENTION

Patents of the Week

➤ A GUARD to protect hose during shoe shines has been patented..

Nicola Francone of Chicago, Ill., developed the device especially for shoe-shine establishments so that workers could avoid getting polish on any customer's hose.

The hose guard, which received patent No. 3,008,146, is made of sheet material such as paperboard, kraft paper or even plastic, that could be easily disposed of after a single use or a limited number of uses.

An attachment that converts an electric razor into a hair trimming device won patent No. 3,008,233 for Jacob E. Waggoner of Charles City, Iowa. It causes the hair to enter the relatively narrow interior slots of the electric razor's regular shaving head, where it is cut.

For next spring's legion of lawn cutters, George I. Wood Jr. of Des Moines, Iowa, has found a method for preventing grass deposits from accumulating on the underside of a rotary mower hood. He was awarded patent No. 3,008,283 and assigned the rights to Western Tool and Stamping Co., also of Des Moines.

An extra plate is installed inside the hood near the top, and is rotated at high speed, thus forcibly ejecting the grass. Mr. Wood said he had found woven glass filaments or plastic to be the best material for the extra plate.

An Australian has come to the rescue of children suffering from infantile eczema by inventing a method, patent No. 3,008,466, for partially restricting their arms. Grace Johnstone Adam of the Royal Alexander Hospital for Children near Sydney said the usual method of treating acute eczema is to bandage and tie the child down, with arms and legs extended, on a bed, to prevent him from scratching himself.

Her device consists of perforated flexible material laced together so that partial movement of the arms is possible.

A carrier, with a detachable cabinet section, for automobile tops won patent No. 3,008,784 for Almon Allard of Wilmington, Mass. It includes a platform with a number of storage elements arranged about its margins and enclosing a central storage well. One or more of the marginal storage elements may be detached from the platform to provide access to the well and to make the contents of the removable section more readily available.

A thermoelectric water cooler for bubble-type fountains won patent No. 3,008,299 for Addison C. Sheckler of Cato, N.Y., who assigned rights to Carrier Corporation, Syracuse, N.Y.

Conventional water coolers, Mr. Sheckler claims, require frequent maintenance of the refrigeration system, are cumbersome in size and a source of noise. By using thermoelectric elements, which have no moving parts, the problems of noise and maintenance are substantially eliminated. Mr. Sheckler improved the efficiency of thermoelectric cooling by directing the inlet water and cooling water in opposite paths to achieve the least possible temperature change across the thermocouples.

A method and apparatus for reproducing and displaying seismic records won patent No. 3,008,792 for William H. Cox of Beaumont, Texas, who assigned rights to Sun Oil Co., Philadelphia.

The conventional reproduction of seismic records, side-by-side traces in an oscillograph, is hard to interpret, particularly in determining the precise time of the occurrence of reflections, Mr. Cox said. Using his invention, the signals are converted to yield photographically or otherwise variable density traces that take the form of variable density dots.

• Science News Letter, 80:374 December 2, 1961

IMMUNOLOGY

Nasal Spray Vaccination Reported by Japanese

➤ MEASLES VACCINATION by nasal spray was reported by a Japanese scientist at the First International Conference on Measles Immunization in Washington, D.C.

Dr. Yoshiomi Okuno of Osaka University, Osaka, Japan, reported cultivation of the Toyoshima strain of measles virus in the birth sac cavity of developing chick embryos.

When given by nasal spray to children, the virus produced mild, measles-like symptoms eight to nine days after vaccination with striking antibody responses, Dr. Okuno said.

• Science News Letter, 80:374 December 2, 1961

PUBLIC HEALTH

Names and Addresses of Syphilis Cases Required

➤ THE NAMES and addresses of all persons with syphilis are now required by the Pennsylvania Department of Health.

The 89th annual meeting of the American Public Health Association in Detroit was told that some 24,792 persons have been followed up because of this change in reporting. Numbers were formerly used.

Dr. Charles L. Wilbar Jr., secretary of health, Commonwealth of Pennsylvania, said this has proved to be an effective method of case finding, and names of individuals are kept in strictest confidence. Only 15 out of 8,000 physicians have refused to give any information.

• Science News Letter, 80:374 December 2, 1961

TECHNOLOGY

Model Used to Teach How Shock Waves Form

See Front Cover

➤ A CONE MODEL in a supersonic tunnel is now being used to teach students how shock waves are formed.

The tunnel and a schlieren apparatus (an optical system making shock waves visible) demonstrate the density variation of the air around the twenty degree cone cylinder. The bow shock waves formed around the cylinder at Mach 3 (three times the speed of sound) can be seen on this week's cover.

The device, designed by the Aerolab Supply Co., Hyattsville, Md., is being used at Yale University, Northwestern University and the Illinois Institute of Technology. A similar model is being used at the University of Maryland.

• Science News Letter, 80:374 December 2, 1961

Questions

ANTHROPOLOGY—How many years ago did Shanidar man live in a warm climate? p. 363.

MEDICINE—Which age group of women most frequently have arthritis? p. 370.

SPACE—How much will the Nimbus satellite weigh? p. 366.

Photographs: Cover, Fremont Davis; p. 363, U. S. Navy; p. 365, National Aeronautics and Space Administration; p. 367, UNESCO/Gerda Bohm; p. 370, National Institutes of Health; p. 376, Fotorite Corp.

Books of the Week

(Continued from p. 372)

Berkner and others; Simon Ramo, Ed.—*McGraw*, 279 p., illus., $6.95. Addressed to the intelligent, interested layman, book describes impact and possibilities of space science and technology.

PIEZOELECTRIC PROPERTIES OF WOOD—V. A. Bazhenov, transl. from Russian—*Consultants*, 180 p., $9.50. Includes results of experimental work on the piezoelectric and physical-mechanical properties of wood and their mutual correlation.

PLANTS, VIRUSES AND INSECTS—Katherine Esau—*Harvard Univ. Press*, 110 p., illus., $3.75. On the complex relations of structure and function of phloem tissue, insects that feed on it and viruses that cause its degeneration.

PRINCIPLES OF ELECTRONIC WARFARE—Robert J. Schlesinger and others—*Prentice-Hall*, 213 p., diagrs., $8. Fundamentals of technical and tactical aspects of military electronics.

PRINCIPLES OF TEXTILE TESTING: An Introduction to Physical Methods of Testing Textile Fibres, Yarns and Fabrics—J. E. Booth—*Chemical Pub. Co.*, 497 p., illus., $12.50. Covers standard methods and instruments as well as recent procedures and tests developed in research laboratories.

THE PUTNAM MEDICAL DICTIONARY—Norman Burke Taylor and Allen Ellsworth Taylor with Ann D. A. Taylor—*Putnam*, 933 p., illus., $4.95. Compact medical dictionary for students and practitioners in nursing and allied health fields.

ROBERT KOCH: Father of Bacteriology—David C. Knight—*Watts, F.*, 165 p., illus. by Gustav Schrotter, $1.95. Juvenile biography.

SCIENCE TODAY: Talks by 15 Outstanding Scientists—Sir Edward V. Appleton and others—*Criterion Bks.*, 192 p., illus., $3.95. Survey of contemporary science based on a recent British television series for high school students.

SPANISH: Spanish-English, English-Spanish (American English)—Based on Fucilla Spanish Dictionary, rev. by Ida Navarro Hinojosa; Emilio C. LeFort, Ed.—*Follett*, 290 p., indexed $2.95; regular $2.50. Modern dictionary with 40,000 entries.

THE STORY OF DOGS—Dorothy E. Shuttleworth—*Doubleday*, 56 p., illus. by G. Don Ray, $2.95. Informs boys and girls about various dog breeds.

THE STORY OF HARBORS—Ben Wattenberg—*Sterling*, 48 p., photographs, $2.50. For boys and girls.

SYNTHESIS OF MOLECULAR AND CELLULAR STRUCTURE—Dorothea Rudnick, Ed.—*Ronald* 252 p., illus., $9. Papers of the Nineteenth Growth Symposium held at Brandeis University, 1960. Subjects range from behavior of nucleic acids and adaptive enzyme control to control of organ regeneration in amphibia.

TMI-GROLIER SELF-TUTORING COURSE: Basic Russian Reading—Marcel I. Weinreich, Ed.—*Teaching Materials Corp.*, 400 p., loose-leaf, boxed, $10. Programmed learning course, teaches Cyrillic alphabet, simple words and phrases.

TECHNICAL DRAWING PROBLEMS. Series II—Henry Cecil Spencer—*Macmillan*, 2nd ed., unpaged, illus., paper, $5.50. Workbook of comprehensive set of practical problem sheets.

WITCH DOCTOR'S APPRENTICE—Nicole Maxwell—*Houghton*, 353 p., photographs, map, $5. Amateur explorer's story of her search for medicinal plants along the tributaries of the Amazon.

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WORD GAME combines skill and chance to provide an exciting game played against time. Two spinners give the first letter of a word and the number of letters. Using a 6-key letter-number unit, the player must complete his word in the allotted time. He tries to choose the word giving the highest point score for all the letters used. Full instructions are included.

• Science News Letter, 80:376 December 2, 1961

UNITED NATIONS FLAGS, each properly identified and attached to a wooden staff with a removable base, are printed in color on heavy silky fabric, measuring 2 by 2¾ inches. A pliofilm envelope protects each of the 100 flags, a collection valuable to teachers or students.

• Science News Letter, 80:376 December 2, 1961

GARDEN TOOL HOLDER that slips over a one-inch wood strip and slides to any position will hold any size tool securely and help solve garden tool storage problems. Made of high-quality, heavy, plated steel, the holders will not rust or bend and will keep tools up and out of the way.

• Science News Letter, 80:376 December 2, 1961

RAPID PRINT PROCESS, which produces prints up to 11 by 14 inches, consists of a compact, power-driven, table-top processor, shown in photograph, with new developing and stabilizing chemicals and special sensitized papers. The photographic

paper on which the negative is exposed is inserted in the processor that automatically turns out a finished, semi-dry print in 5 to 15 seconds.

• Science News Letter, 80:376 December 2, 1961

PLASTIC ADHESIVE TAPE is a transparent tape half as thick as cellophane, yet one-third as strong as sheet metal. Waterproof and weatherproof, it is useful for repairing or reinforcing all plastics in frequent contact with water such as umbrellas, boots or shower curtains, and for sealing packages for mailing or for freezer storage.

• Science News Letter, 80:376 December 2, 1961

PREFABRICATED ENTRYWAY added to the front entrance of the home provides a hallway for a house entered directly through the living room. Each unit is custom-made to the contractor's precise measurements. The entryway will help reduce heating costs in winter and keep the home cleaner. A choice of styles, colors and surface finishes is available.

• Science News Letter, 80:376 December 2, 1961

POCKET-SIZE SURVIVAL KIT contains 20 first aid and survival items, including water purification tablets, ammonia inhalant and waterproofed matches, plus a 16-page illustrated instruction booklet. Packed in a compact plastic case, it is ideal for hikers, hunters, explorers.

• Science News Letter, 80:376 December 2, 1961

OVERHEAD PIPE BRUSH with a 36-inch handle enables a person to clean overhead pipes safely from the floor. A unique circular head that slips onto the pipe with a simple twist comes in two sizes and in two types of bristles, for wet or dry cleaning. Handle lengths can be ordered to fit special needs.

• Science News Letter, 80:376 December 2, 1961

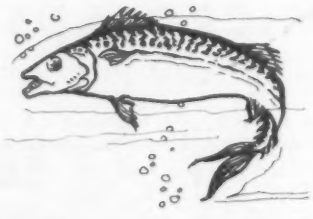
Nature Ramblings

SOME of the world's many fishes change their ways of life during winter. At the approach of cold weather, certain fresh-water species seek the deepest water they can find. Here the water temperature is likely to be fairly constant. These fishes winter at certain depths with hardly any movement. They do very little feeding during this inactive interval.

Marine fishes such as the fork-tailed mackerel and the basking shark also change habits in winter. In summer the mackerel feeds on plankton, a general term for tiny plants and animals massed together near and on the ocean's surface. At summer's end, the plankton is nearly non-existent. Now the mackerel swims to deep water and remains close to the bottom in a nearly inactive state.

The basking shark, also a plankton feeder, leaves the ocean's surface in the fall. It swims to an area near the continental shelf. Here, this shark remains close to the bottom, nearly motionless, seldom breathing, and seemingly more dead

Mackerel



than alive. For nourishment, it draws on the carbohydrates in the liver.

A fresh-water fish, the silver or golden carp, passes the winter in the mud of a pond, lake or stream. This fish wriggles around in the mud until it is nearly covered.

The hibernation of the carp is affected by its breathing and the water temperature. A water temperature of 57 degrees Fahrenheit means the carp breathes 57 to 75 times a minute.

• Science News Letter, 80:376 December 2, 1961

Do You Know?

Overeating and unbalanced *diets* are the two biggest hazards to health.

An X-ray device that will automatically detect and reject *fish* fillets and portions containing bones has been developed.

Automobiles are a major source of air *pollution*, ranking first among nine leading sources which include the petroleum industry and combustion of fuels.

Air pollution can cause the crumbling of *marble* in buildings.

Studies reveal that heart attacks and strokes show up 15 years earlier among people in countries where *overeating* is prevalent.

Future control of *cancer* may lie in the immunity reactions which human cells indiscriminately employ to combat both disease germs and healing tissue grafts, according to some immunologists.

• Science News Letter, 80:376 December 2, 1961